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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/582,459

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Paul Wallace

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02/02/2010

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EXAMINER

CLARK, GREGORY D

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

02/02/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,459	Applicant(s) WALLACE ET AL.	
	Examiner GREGORY CLARK	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/20/2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The examiner acknowledges the receipt of applicants' arguments dated 11/17/2009.

Claims 1-23 pending.

Terminal Disclaimer

The terminal disclaimer filed on 11/20/2009 disclaiming the terminal portion of any patent granted on this application has been recorded. The double patenting rejections have been withdrawn.

Claim Rejections - 35 USC § 102

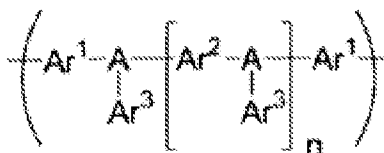
1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Antoniadis (US 5,948,552).**

3. **Regarding Claims 1 and 11-14**, the applicant claims an optionally substituted oligomer of polymer comprising a repeat unit of Formula 1:

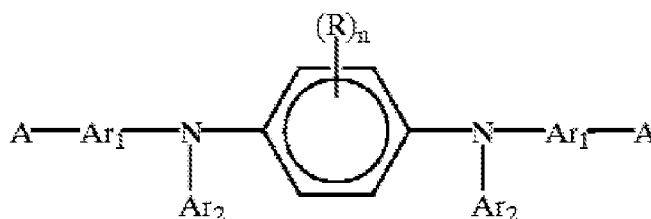


Formula 1

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Wherein n is at least 1; each A is N or P; each Ar₁ and Ar₃ is arylene or heteroarylene; Ar₂ is arylene or heteroarylene containing a linking ring to which the two A atoms are both directly linked and at least one of Ar₁ or Ar₂ is substituted with at least one substituent.

Antoniadis discloses formula A-1 (column 9, line 45):



Formula A-1 shows n = 1, A = N, Ar₁ corresponds to applicants' Ar₁, Ar₂ to applicants' Ar₃ and the phenyl linking group corresponds to applicants' Ar₂. The phenyl linking group connects both N atoms.

Antoniadis also discloses A in formula A-1 is a chlorine or bromine (claim 12) (column 9, line 50 and column 8, lines 43-44) and the reactions can be catalyzed by palladium (variable oxidation state metal) (column 10, lines 29-30) (per claims 11 and 13).

Antoniadis also discloses that the reaction can be carried out in the presence of a catalytic amount of a divalent nickel salt (column 11, lines 23-26) (per claim 14).

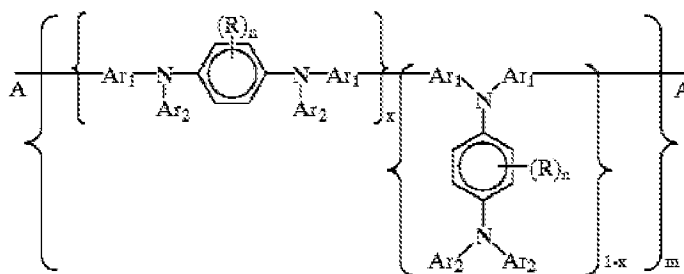
4. **Regarding Claim 2**, Antoniadis discloses that the R substituent on the phenyl linking group can be a C₁-24 hydrocarbyl (alkyl) alkyl group (abstract).

5. **Regarding Claim 3**, Antoniadis discloses an R substituent on the phenyl linking group of A-1.

6. **Regarding Claim 4**, Antoniadis discloses that the phenyl linking group corresponding to applicants' Ar2. Ar1 of A-1 can be an aryl group C6-18 which includes a phenyl group (abstract).

7. **Regarding Claims 5 and 9**, Antoniadis discloses that Ar2 in A-1 which corresponds to applicants' Ar3 can be substituted with C1-24 hydrocarbyl (alkyl) alkyl group (abstract).

8. **Regarding Claims 6-8**, Antoniadis discloses that A-1 form can polymer with a second repeating unit represented by formula A-2 (abstract):



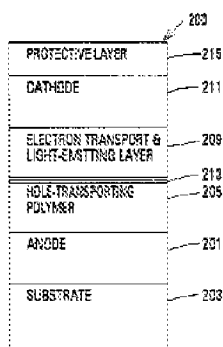
Monomer 1 is conjugated to monomer 2 (per claim 7) which is triarylamine (per claim 8).

The reaction can be carried in the presence of palladium (catalyst) and sodium t-butoxide (base) (column 10, lines 29-30).

9. **Regarding Claim 10**, Antoniadis discloses that A-2 is a hole conducting (transporting) material (abstract).

10. **Regarding Claims 15 and 16**, Antoniadis discloses that the reactions to can be catalyzed by palladium (column 10, lines 29-30) with A (leaving group) being chlorine or bromine (column 9, line 50 and column 8, lines 43-44). The A (leaving group) can be boronic acid derivatives catalyzed by palladium (column 13, lines 22-25). The reactions are carried in the presence of palladium (catalyst) and sodium t-butoxide (base) (column 10, lines 29-30).

11. **Regarding Claims 17-20**, Antoniadis discloses that the conductive polymer can be used in an electroluminescent device (optical device) (abstract). The hole conducting layer/hole transporting layer is formed from the poly (arylmime) (K-2) (column 3, lines 65-66) (column 5, lines 1-3). The hole transporting layer is located between the anode and cathode see figure 1 below:



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Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antoniadis (US 5,948,552) in view of Allen (US 6,858,703).**

13. **Regarding Claim 21 and 23, Antoniadis** discloses that the copolymers can be used in an electroluminescent device (abstract) but fails to mention a switching device.

Allen discloses that triarylamine polymers are used in optical sensor, switching devices and field effect transistors (column 83, lines 20-30).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to have used the electroluminescent device of Antoniadis in applications taught by the prior art which would have included the applications disclosed by Allen which read on applicants' claimed applications.

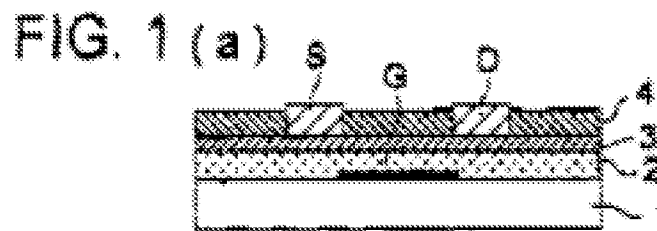
14. **Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Antoniadis (US 5,948,552) in view of Allen (US 6,858,703) and further in view of Hirai (US 6,740,900).**

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15. **Regarding Claim 22**, Antoniadis in view of Allen disclose triarylamine polymers used as a field transistors but fail to mention the structure of the device.

Hirai discloses that an insulator layer can be placed in various locations with respect to the gate, drain and source electrodes in an organic thin-film transistor.

Hirai discloses that the organic thin-film transistor contains a organic semiconductor layer 3, a gate electrode G, a drain electrode D, and a source electrode S that are in Figure I(a) shown below:



Hirai further discloses that a dielectric layer (field-effect transistor) serves as gate insulation layer 2 (column 7, lines 44-45). The above figure shows that the gate electrode G and the organic semiconductor layer 3 are both in contact with the gate insulation layer 2 located on side one. In addition, the above figure shows that the source electrode S and the drain electrode D are located on the organic semiconductor layer 3 on side two.

Hirai shows in the prior art that the claimed structure can be used as a field effect transistor.

With the reasonable expectation of success a person with ordinary skill in the art at the time of the invention would have selected from known field-effect transistor structures and readily substituted the conductive polymers disclosed by Antoniadis (K-2) for the organic semiconductive layer 3 disclosed by Hirai in Figure I (a) since the conductive polymers of Antoniadis would be functional equivalents to the polymers typically used to make an organic semiconductive layer.

Response to Arguments

The examiner acknowledges that the Inbasejaran reference in the previous office failed to show substituents in either Ar1 of Ar2 groups. The Antoniadis reference replaces Inbasejaran in the current office action which addresses applicants' arguments.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wu (US 5,728,801).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

GREGORY CLARK/GDC/
Examiner
Art Unit 1794